Summary of the CalCOFI "State of the CA Current" report
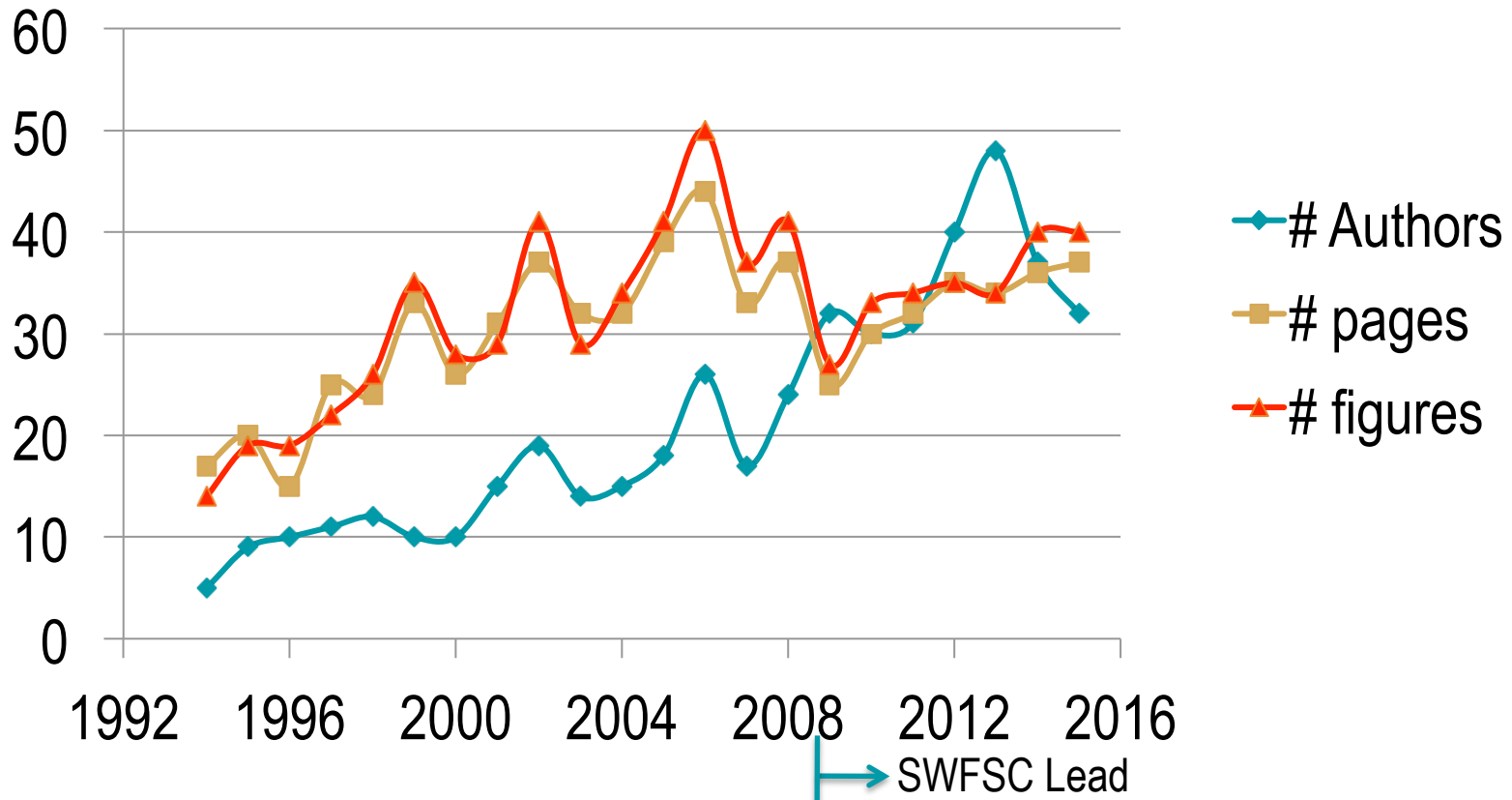
Andrew W. Leising
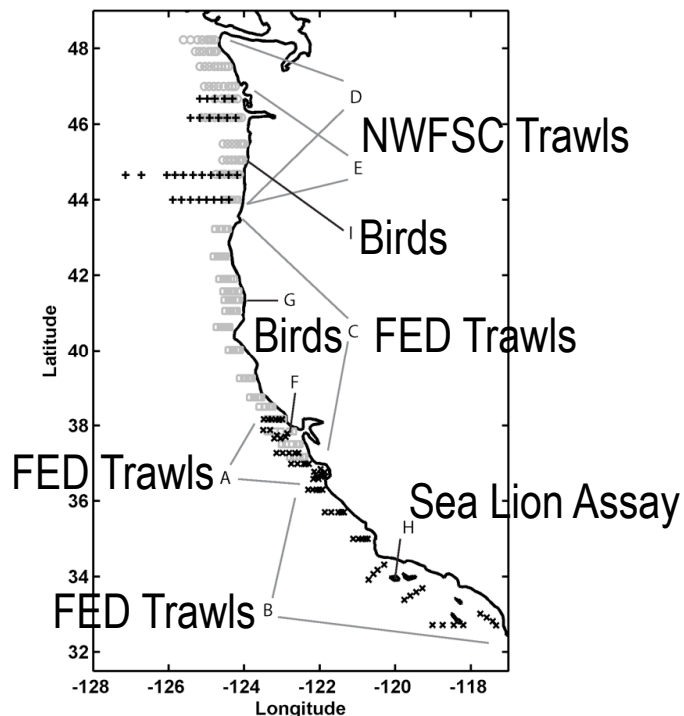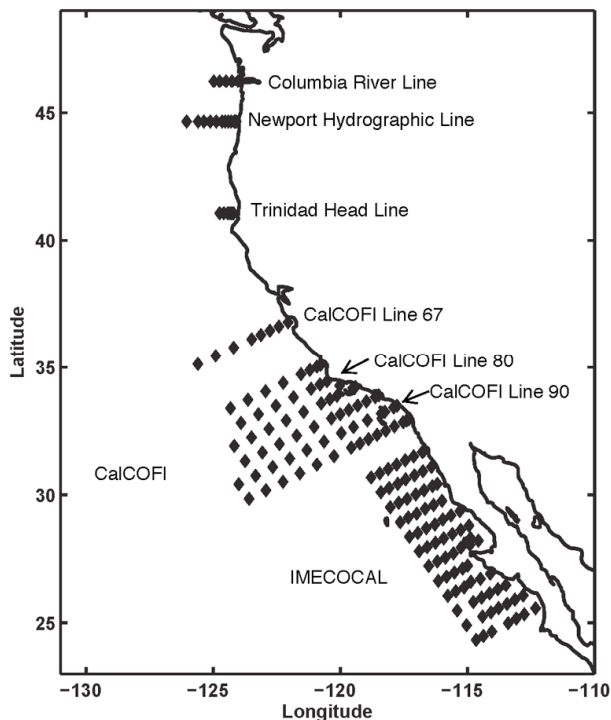Environmental Research Division
FATE FTE

Agenda item 2.9: CCLME

What is the CalCOFI state of the CCS report?

- **Peer-reviewed, science-based summary/synthesis of the most recent (1-2 yr) biological oceanographic conditions *throughout* the California Current Ecosystem**
  - Data and analysis from the entire CCS, not just CalCOFI region
  - Basic physical and biological oceanographic data, many fish, jellies, birds, a few marine mammals
  - > 30 co-authors: 3 Science divisions at SWFSC (ERD, FED, FRD), NWFSC, AFSC, SIO, Humboldt State, Oregon State, MBARI, UCDavis, Farallon Institute, Point Blue, CICISE, CA Sea Grant

- **Targeting scientists, but accessible to managers**
  - **For past 3 years, has formed the "backbone" of the PFMC's (FEP) requested "State of the CA Current Report" which is compiled by IEA staff**

- Q1: Ecosystem-related program goal, Q2: Addresses management need,   Q4: Strategy to obtain climate and ecosystem data, Q5: Analyzing ecosystem processes, Q6: Integration into management advice, Q7: Peer reviewed, Q8: communication of results
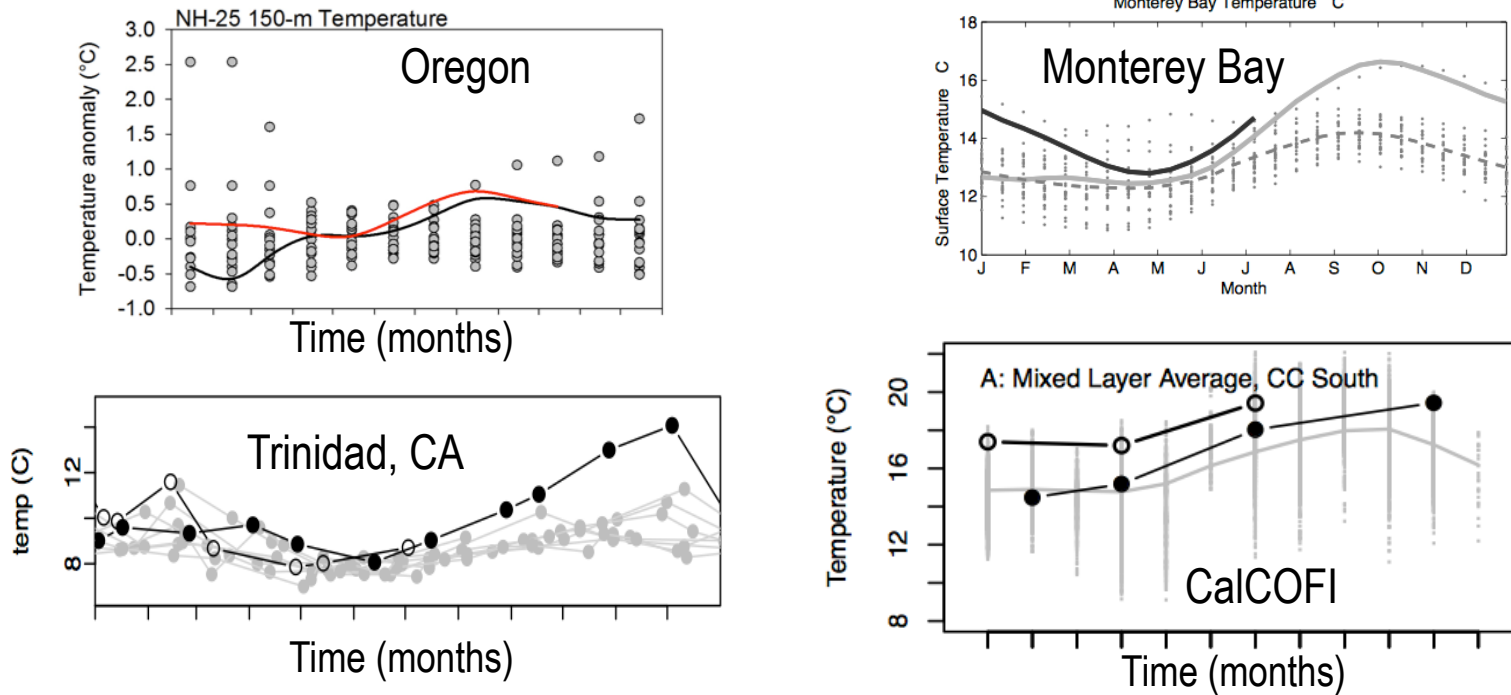
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Brief history of the Report:
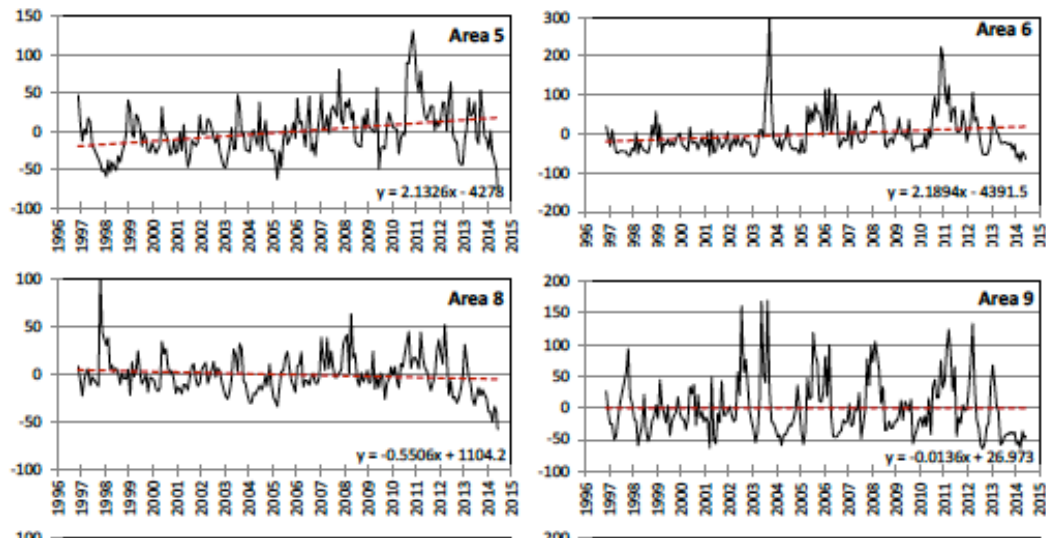
Data Source Locations:

Example of (similarly sampled) Data included each year:

Report highlights last two years, and places data within historical context

Example special (hot) topic, "one-off" analyses:

2014: Spatial analysis of long-term satellite Chl-a data
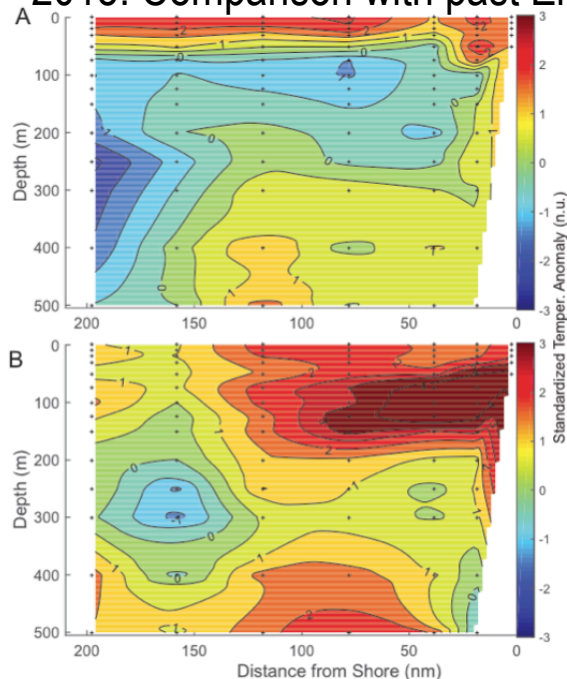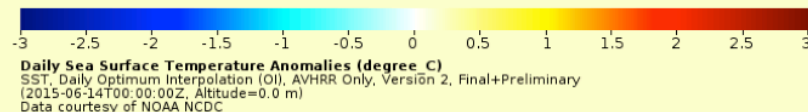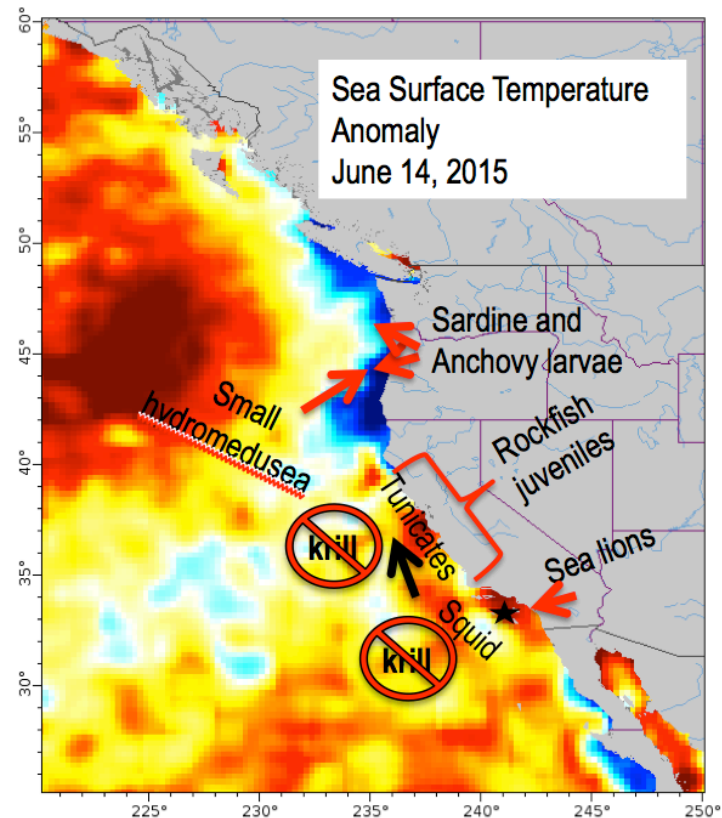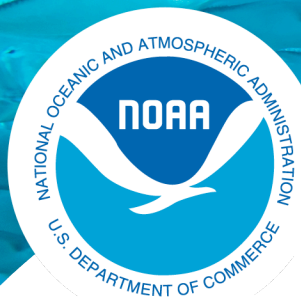
2015: Comparison with past El Niño

Figure 38. Standardized temperature anomalies, these have no units (n.u.), along CalCOFI line 80 plotted against depth and distance from shore for periods corresponding to the height of the 2014–15 warm anomaly (A: CC201501) and the 1998 El Niño (B: CC199802). Plotted data are deviations from expected values in terms of standard deviations in order to illustrate the strength of the relative changes at different depths.
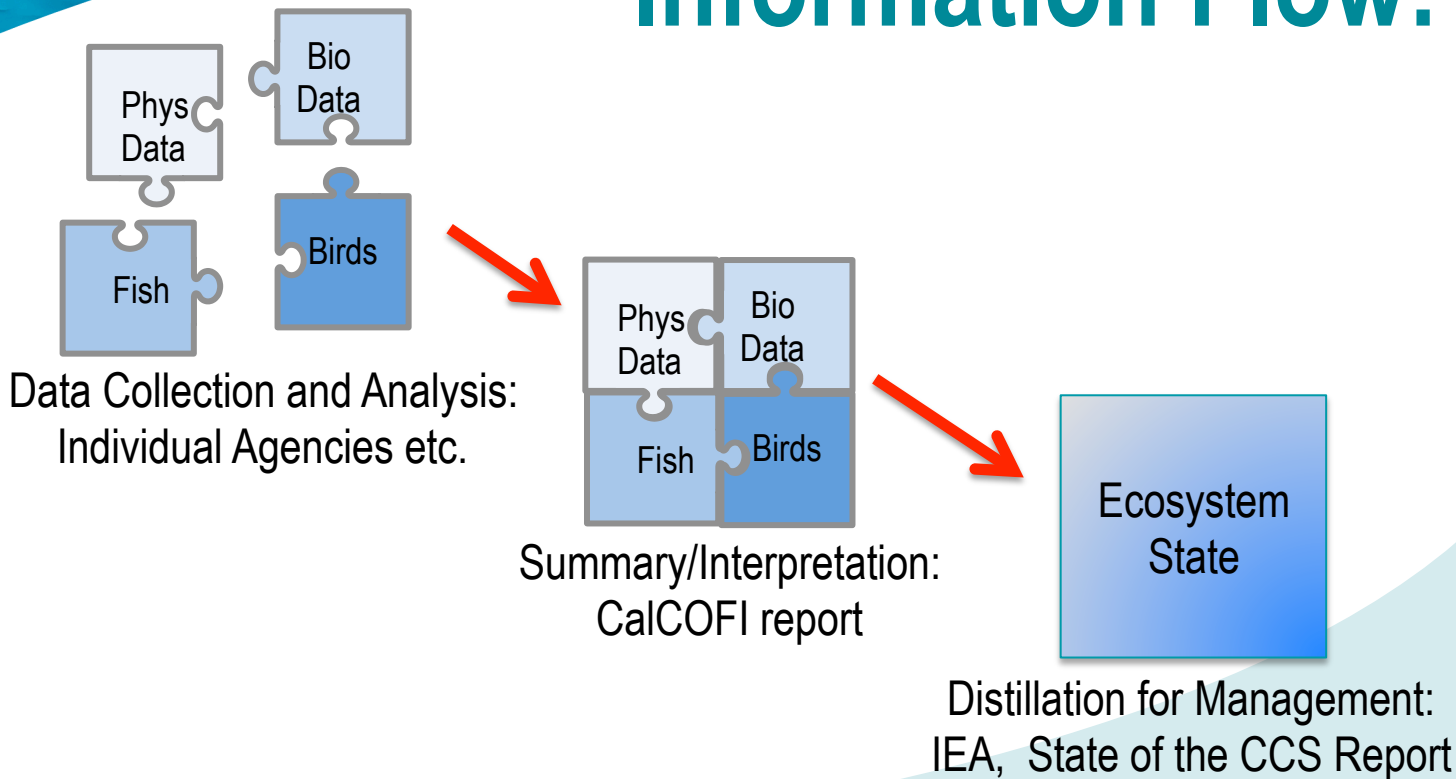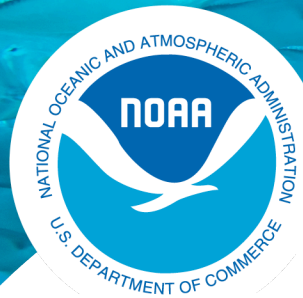
Example Synthesis: 2015 "Blob" Impacts

- **Documented arrival and onset of Blob along entire coast**
- **Showed that most warming was due to Blob and not El Niño**
    - **Important for understanding source of changes and interpreting community composition**

- Phytoplankton was patchy and lower than previous years
- Sardine and Anchovy went north
- Market squid shifted north and numbers decreased
- Krill decreased
- Rockfish juveniles did ok on central CA coast
- Seabirds did ok depending on location
- Sea lions did poorly
- "new" (oceanic) species everywhere along the coast!!!

Sea Surface Temperature Anomaly
June 14, 2015

Daily Sea Surface Temperature Anomalies (degree_C)
SST, Daily Optimum Interpolation (OI), AVHRR Only, Version 2, Final+Preliminary
(2015-06-14T00:00:00Z, Altitude=0.0 m)
Data courtesy of NOAA NCDC

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Information Flow:

Data Collection and Analysis:
Individual Agencies etc.

(Phys Data, Bio Data, Fish, Birds)

Summary/Interpretation:
CalCOFI report

(Phys Data, Bio Data, Fish, Birds)

Ecosystem State

Distillation for Management:
IEA, State of the CCS Report

Increasing Accessibility and Relevance:

Challenge: The report takes many months to gather data and assemble, get peer review and finally publish

By publication time, report is ~ 6 months old

Solution: For data that is more readily available (mostly physical) we have created a "Live" state of the CA current web page, with semi-self-updating information

Increasing Accessibility and Relevance:

Format is similar to that used for IEA web portal

Index	State	Trend	Implication
PDO	Positive	Increasing	Warming
NPGO	Negative	Decreasing	Low Productivity
ENSO (MEI)	Positive	Increasing	El Nino
Upwelling Anomaly	Negative	Neutral	Warm, low productivity
Cumulative Upwelling	Neutral	Neutral	Ave yearly upwelling
SST anomaly (buoy)	Positive	Increasing	Warm surface waters
SST anomaly (satellite)	Positive	Increasing	Warm surface waters
Wind anomaly	Cyclonic	Anti- to Cyconlic	Warm surface waters
TS, CalCOFI	Warmer and Saltier at surface in North region	NA	Change in transport
Mixed layer salinity, CalCOFI	Positive Anomaly	Decreasing	
Mixed layer NO3, CalCOFI	Negative Anomaly	Neutral	Decreased Productivity
Nitricline Depth, CalCOFI	Negative Anomaly	Decreasing	Decreased productivity
Integrated Chl-a, CalCOFI	Neutral	Neutral	Similar to long term mean
Integrated PP, CalCOFI	Positive Anomaly	Increasing	Possibly higher productivity
Zooplankton Volume,CalCOFI	Positive Anomaly	Increasing	Increased secondary production
Chl-a Profiles, CalCOFI	High in Coastal North	NA	Increased productivity
Chl-a	Negative	Decreasing	Low productivity

Increasing Accessibility and Relevance:

CalCOFI — CALIFORNIA COOPERATIVE OCEANIC FISHERIES INVESTIGATIONS
NOAA - NMFS | CDF&W | IOD - SIO

Home | Cruises | Field Work | Data | Publications | Conference | Contacts | Affiliates | About CalCOFI

Home ▶ Publications ▶ State of the California Current: Live supplement

Publication Resources
- PDF Readers
- Instructions to
- Data Report Format
- NOAA Ichthyoplankton Library

Resources
- Contacts
- Graphics & Photos
- Library
- References
  - Methods
  - Data Formats
  - Radiation Safety Manual
  - CalCOFI Handbook
  - El Niño and La Niña
- Software
- Web Links
  - CCE-LTER Methods Manual

Typical Indices found in Report

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Increasing Accessibility and Relevance:

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Strengths, Challenges, and Strategies

- **Strengths:**
    - **Brings together data from many different sources (and long time series)**
    - **Provides detailed scientific analyses and summaries**
    - **Provides a reliable, one-of-a-kind synthesis of the CCS**
    - **SWFSC-led retains "fisheries" emphasis**
    - **Pipeline now exists to get this info straight to management via FEP requested report**

- Challenges:
    - It's an exercise in extreme cat herding
    - Timeliness of information (~ 6 months old when finally published)
    - Could benefit from additional partners or data (e.g. SWFSC MMTD data)

- Strategies:
    - Increased automation of report generation (data submission via FTP, plot creation centralized)
    - "Live" website
    - Further integration with IEA

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